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193186 MLRS MISSILE NUMBER BN-306 BN-315 BN-311 BN-318  
BN-321 ROUND NUMBER (U) ARMY ELECTRONICS RESEARCH AND  
DEVELOPMENT COMMAND WSMR NM ATM. D C KELLER JUL 83

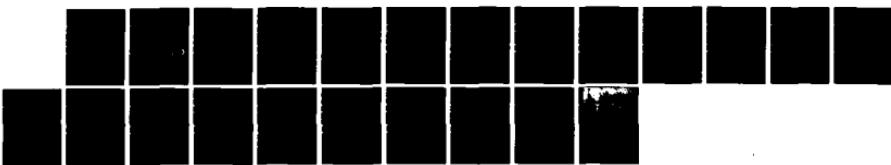
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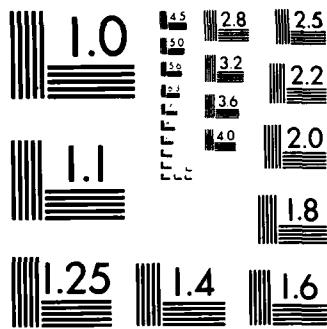
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METEOROLOGICAL DATA REPORT

19318B MLRS  
Missile Number BN-306, BN-315,  
BN-311, BN-318, BN-321  
Round Number 473/DL-19 thru 478/DL-24  
18 JUL 1983

by

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ATMOSPHERIC SCIENCES LABORATORY  
WHITE SANDS MISSILE RANGE, NEW MEXICO

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20. ABSTRACT (Continue on reverse side if necessary and identify by block number)	<p>Meteorological data gathered for the launching of the 19318B MLRS, Missile Number BN-306, BN-315, BN-311, BN-318, BN-314, BN-321, Round Number 473/DL-19 thru 478/DL-24 are presented in tabular form.</p>	

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## CONTENTS

	PAGE
INTRODUCTION -----	1
DISCUSSION -----	1
GENERAL AREA MAP -----	2
LAUNCH AREA DIAGRAM -----	3
TABLES:	
1. Surface Observations taken at 1400 MDT at LC-33 -----	4
2. Anemometer-Measured Wind Speed and Direction, LC-33 Fixed Pole, taken at 1400 MDT -----	5
3. Anemometer-Measured Wind Speed and Direction, Tower Levels 1, 2, 3, and 4, taken at 1400 MDT -----	5
4. Launch and Impact Pilot-Balloon Measured Wind Data -----	6
5. Aiming and T-TimeComputer Met Messages -----	7
6. LC-37 Significant Level Data at 1200 MDT -----	8
7. LC-37 Upper Air Data at 1200 MDT -----	9
8. LC-37 Mandatory Levels at 1200 MDT -----	10
9. WSD Significant Level Data at 1228 MDT -----	11
10. WSD Upper Air Data at 1228 MDT -----	12
11. WSD Mandatory Levels at 1228 MDT -----	13
12. WSD Significant Level Data at 1400 MDT -----	14
13. WSD Upper Air Data at 1400 MDT -----	15
14. WSD Mandatory Levels at 1400 MDT -----	16

## INTRODUCTION

19318B MLRS, Missile Numbers BN-306, BN-315, BN-311, BN-318, BN-314 and BN-321, Round Numbers 473/DL-19 thru 478/DL-24, were launched from LC-33, White Sands Missile Range (WSMR). New Mexico, at 1400:0, 1400:05, 1400:14, 1400:19 and 1400:23 MDT, 18 JUL 83. The Scheduled launch times were 1400 MDT with a 4.5 second separation.

## DISCUSSION

Meteorological data were recorded and reduced by the White Sands Meteorological Team, Atmospheric Sciences Laboratory (ASL), White Sands Missile Range, New Mexico. The data were obtained by the following methods:

### 1. Observations

#### a. Surface

(1) Standard surface observations to include pressure, temperature ( $^{\circ}\text{C}$ ), relative humidity, dew point ( $^{\circ}\text{C}$ ), density ( $\text{gm/m}^3$ ), wind direction and speed, and cloud cover were made at the LC-33 Met Site at T-0 minutes.

(2) Anemometer data were provided from existing pole-mounted and tower-mounted anemometers at LC-33. Monitor of wind speed and direction from one anemometer was also provided in the launch control room.

#### b. Upper Air

(1) Low level wind data were obtained from pilot-balloon observations at:

### SITE AND ALTITUDE

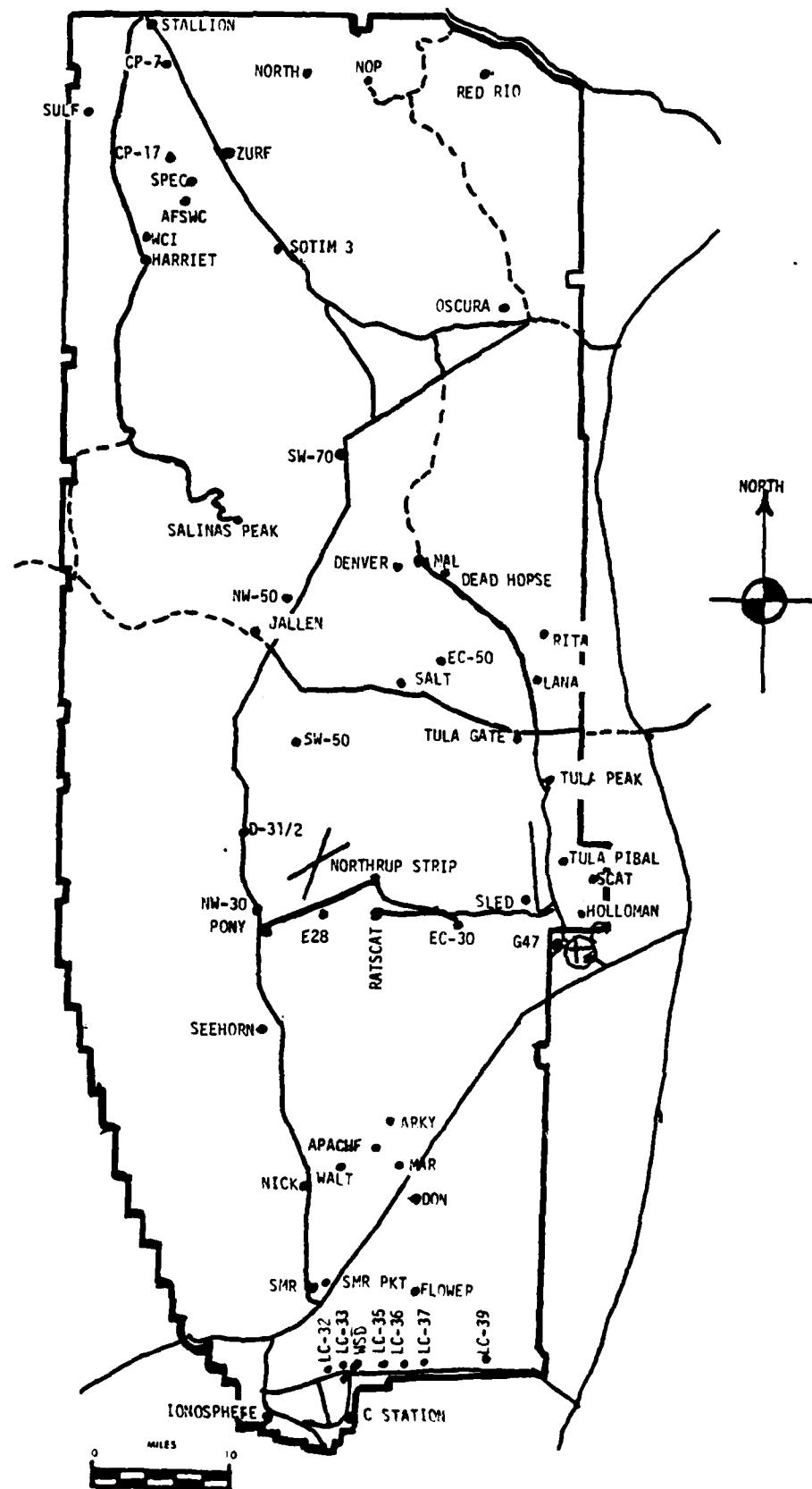
LC-33	2 Km
DON	2 Km

(2) Air structure data (rawinsonde) were collected at the following Met Sites.

### SITE AND TIME

LC-37	1200 MDT
WSD	1228 MDT
WSD	1400 MDT

## WSMR METEOROLOGICAL SITES



LC-33  
Launch Area

NORTH

WEST

1 inch = 250 ft

Y186,500

MET  
Tower

Y186,000

T-9 Radar

Y185,500

X485,000

Y185,000

X495,500

X496,000

L-600

L-579A

L-851A

L-519A

L-350A

Anemometer Pole #1

Anemometer Pole #2

Anemometer Pole #3

Line of Fire

## PROCTER SURFACE OBSERVATION

TABLE 1

DATE 18 July 83

TIME MDT	PRESSURE in. Hg	TEMPERATURE in. F.	DEW POINT in. C.	RELATIVE HUMIDITY %	WIND dgs. TN	DIRECTION dgs. TN	SPEED kts	CHARACTER	VISIBIL- ITY
1400	879.9	34.8	13.6	28		120	12		50

OBSTRUCTIONS TO VISIBILITY	CLOUDS				REMARKS
	1st LAYER AMT	TYPE	2nd LAYER AMT	TYPE	

## PSYCHROMETRIC COMPUTATION

TIME: MDT	1400		
DRY BULB TEMP.	34.8		
WET BULB TEMP.	20.4		
WET BULB DEPR.	14.4		
DEW POINT	13.6		
RELATIVE HUMID.	28		

TABLE 2 LC-33 FIXED POLE ANEMOMETER MEASURED WINDSDATE 18 JUL 83 1400 M D T

\*\*

POLE #1 X485,874.29 Y185,958.90 H4018.74 38.7 ft. AGL			POLE #2 X485,874.29 Y186,012.00 H4033.57 53.0 ft. AGL			POLE #3 X485,877.29 Y186,116.06 H4063.92 83.6 ft. AGL		
T-TIME SEC	DIR DEG	SPEED KNOTS	T-TIME SEC	DIR DEG	SPEED KNOTS	T-TIME SEC	DIR DEG	SPEED KNOTS
T -30	120	16	T -30	115	09	T -30	126	16
T -20	120	15	T -20	114	09	T -20	132	14
T -10	120	14	T -10	109	09	T -10	128	15
T 0.0	120	15	T 0.0	121	08	T 0.0	125	15
T +10	120	09	T+10	105	03	T+10	121	12

TABLE 3 LC-33 METEOROLOGICAL TOWER ANEMOMETER MEASURED WINDS (202 FT TOWER)

LEVEL #1, 12 FEET X484,982.64, Y185,057.73, H3983.00 (base)			LEVEL #2, 62 FEET X484,982.64, Y185,057.73, H3983.00 (base)		
T-TIME SEC	DIR DEG	SPEED KNOTS	T-TIME SEC	DIR DEG	SPEED KNOTS
T -30	118	10	T -30	125	15
T -20	124	13	T -20	123	15
T -10	124	10	T -10	121	14
T 0.0	120	12	T 0.0	120	15
T +10	MISS	MISS	T+10	MISS	MISS

LEVEL #3, 102 FEET X484,982.64, Y185,057.73, H3983.00 (base)			LEVEL #4, 202 FEET X484,982.64, Y185,057.73, H3983.00 (base)		
T-TIME SEC	DIR DEG	SPEED KNOTS	T-TIME SEC	DIR DEG	SPEED KNOTS
T -30	105	16	T -30	123	17
T -20	108	17	T -20	105	17
T -10	108	19	T -10	105	16
T 0.0	110	18	T 0.0	108	18
T +10	108	17	T+10	117	17

\*\* Pole #1 Dirs are estimated

TABLE 4

## T-TIME PILOT-BALLOON MEASURED WIND DATA

DATE 18 JUL 83

SITE: LC-33  
 TIME: 1400 MDT  
 WSTM COORDINATES:  
 X= 484,837.34  
 Y= 184,124.44  
 H= 3,975.57

SITE: DON  
 TIME 1400 MDT  
 WSTM COORDINATES:  
 X= 511,988.37  
 Y= 247,396.36  
 H= 3,996.83

LAYER MIDPOINT METERS AGL	DIRECTION DEGREES	SPEED KNOTS
SURFACE	120	12
150	123	18
210	127	17
270	130	16
330	131	15
390	131	14
500	128	13
650	103	10
800	103	12
950	106	11
1150	104	10
1350	122	10
1550	137	12
1750	123	13
2000	099	08

Data obtained from Double Theodolite  
 tracked pilot-balloon observation.

LAYER MIDPOINT METERS AGL	DIRECTION DEGREES	SPEED KNOTS
SURFACE	130	03
150	142	10
210	141	12
270	137	12
330	134	13
390	133	13
500	132	13
650	126	12
800	126	11
950	131	12
1150	132	15
1350	134	15
1550	142	15
1750	139	15
2000	128	09

Data obtained from a Single Theodolite  
 tracked pilot-balloon observation.

TABLE 5

## AIMING AND T-TIME COMPUTER MET MESSAGES

18 July 1983

LC-37 1200 MDT	WSD 1228 MDT	WSD 1400 MDT
METCM1324063	METCM1324064	METCM1324064
181800124-879	181850122881	182000122880
00258006 30550879	00240010 30750881	00267010 30930880
01278013 30410869	01250014 30540871	01265012 30560870
02258008 30100845	02258011 30260847	02220008 30290846
03211006 29710807	03281011 29850810	03222012 29860809
04181014 29250762	04256007 29320764	04206013 29350763
05143016 28770719	05171013 28790721	05207012 28870720
06173016 28440677	06152014 28480679	06180013 28450678
07126016 28120637	07148013 28170639	07165015 28060639
08182016 27820600	08187014 27850602	08193010 27800601
09221017 27580564	09233017 27630566	09224015 27610565

INITIAL ALTITUDE 4651.37 FT MSL  
1<sup>st</sup> JULY 1975  
ASCENSION 1.0, 10<sup>th</sup>

SIGNIFICANT LEVEL DATA  
1990160104  
LC-37

GEOPHYSICAL COORDINATES  
32.40175 LAT DEG  
106.31232 LON DEG

TABLE 6

MILLIBARS	WIND FLEET	WIND DIRECTION AT ALTITUDE	TEMPERATURE DIFFERENCE	AIR DEWPOINT CENTIGRDE	REL. HUM. PERCENT
670.0	4051.4	30.3	15.2	40.0	
670.0	4440.8	28.7	14.1	41.0	
670.0	5037.5	26.2	12.6	43.0	
740.4	9002.8	15.2	9.7	65.0	
721.4	9608.3	13.3	8.0	70.0	
700.0	10519.1	10.6	6.0	76.0	
686.0	11057.7	10.8	4.7	66.0	
653.8	13230.4	6.7	6.6	65.0	
660.5	14682.9	4.1	-2.3	63.0	
692.2	13055.5	3.0	-6.1	41.0	
581.3	15551.7	3.5	-7.0	46.0	
567.3	16201.6	2.8	-10.6	36.0	
534.9	17755.6	-1.3	-11.7	45.0	
518.9	18549.9	-2.6	-19.9	25.0	
500.0	19518.4	-2.1	-24.5	16.0	

STATION ALTITUDE 4051.37 ft. ASL  
14 JULY 1973 1200 MET  
ASCENT/DESCENT 10<sup>4</sup>

WEIGHT AIR DATA  
1990180104  
IC-37  
TABLE 7

CELESTIAL ALTITUDE MSL FEET	PRESSURE IN MILLIBARS	TEMPERATURE AIR DEWPOINT CHARTGRAPH	REFRACTIVE INDEX OF	DENSITY PERCENT	CM/Cubic METER	SOUND KNOTS	REFRACTION DEGREES (T)	WIND DATA DIR/VELOC KNOTS	SPRFL KNOTS	INDEX OF REFRACTION
4051.4	879.2	30.3	15.2	40.0	1001.8	681.2	145.0	6.0	1.000294	
4000.0	869.8	28.5	16.0	41.2	993.1	678.9	142.8	6.2	1.000288	
3900.0	851.1	26.4	12.7	42.9	983.5	676.4	140.5	6.5	1.000281	
3600.0	836.3	24.0	12.4	45.6	971.1	674.6	138.4	6.7	1.000278	
3000.0	821.7	23.5	12.0	48.0	958.6	673.2	136.5	7.0	1.000274	
2600.0	807.4	22.1	11.6	51.1	946.4	671.6	132.5	7.2	1.000270	
2000.0	795.3	20.8	11.1	53.9	934.4	670.0	103.4	7.9	1.000266	
17500.0	779.5	19.4	10.6	56.7	922.6	668.4	101.1	9.6	1.000262	
1600.0	765.9	18.6	10.0	59.4	911.0	666.7	98.7	11.9	1.000258	
15000.0	752.6	16.6	9.3	62.2	906.5	665.1	96.3	13.1	1.000254	
9000.0	739.5	15.2	8.7	65.0	888.2	663.3	94.0	14.0	1.000249	
7500.0	726.3	13.8	8.2	68.6	878.7	661.8	84.8	15.2	1.000245	
10000.0	712.5	12.3	7.4	72.3	865.8	660.0	80.6	16.3	1.000241	
10500.0	708.5	10.7	6.6	75.9	858.0	658.0	80.2	16.8	1.000236	
11000.0	687.5	10.8	6.9	67.1	839.9	658.0	83.4	16.1	1.000228	
11500.0	672.4	10.0	5.9	65.8	827.2	657.0	84.2	15.5	1.000222	
12000.0	662.1	9.0	5.9	65.6	815.1	656.8	83.2	14.9	1.000218	
12500.0	651.6	8.1	2.0	65.3	803.1	654.7	82.8	14.7	1.000213	
13000.0	639.2	7.1	1.0	65.1	791.3	653.5	83.1	14.7	1.000208	
13500.0	627.6	6.2	0.1	64.6	779.0	652.4	85.6	15.5	1.000204	
14000.0	615.9	5.3	-0.9	63.9	767.0	651.3	90.4	16.0	1.000199	
14500.0	604.6	4.4	-1.9	63.3	756.3	650.1	99.9	16.0	1.000195	
15000.0	592.4	3.9	-7.1	44.3	744.4	649.2	109.2	16.2	1.000194	
15500.0	582.4	3.5	-7.1	45.5	731.6	648.8	113.7	16.3	1.000181	
16000.0	571.6	3.6	-9.5	39.1	719.0	648.0	124.4	16.4	1.000175	
16500.0	560.9	2.0	-10.9	37.7	708.9	646.8	124.4	16.2	1.000171	
17000.0	550.1	0.7	-11.1	40.6	698.9	645.3	124.0	15.1	1.000169	
17500.0	540.1	-0.6	-11.5	43.5	689.2	643.7	122.9	13.3	1.000166	
18000.0	529.0	-1.7	-13.0	38.8	679.1	642.3	114.8	11.4	1.000162	
18500.0	519.9	-2.5	-19.2	26.3	668.6	641.2	101.4	9.9	1.000156	
19000.0	510.0	-2.4	-21.8	20.8	655.6	641.3	1.000152			
19500.0	500.4	-2.1	-24.4	16.2	642.7	641.6			1.000148	

STATION ALTITUDE 4051.37 FT. MSL  
12 JULY 63 1200 MDT  
ACCLINATION NO. 404

MANDATORY LEVELS  
1990100104  
LC-37

TABLE 8

GEODETIC COORDINATES  
32°40'17" LAT DEG  
106°31'23" LONG DEG

MANDATORY LEVELS		WIND DATA				
millibars	feet	air degrees	DEWPONT CENTIGRADE	PERCENT DEGREES (IN) KNO15	DIRECTION DEGREES (IN) KNO15	SPEED KNO15
850.0	5034.	26.2	12.6	43.	140.4	6.5
800.0	6775.	21.4	11.3	53.	114.5	7.5
750.0	6597.	16.3	9.2	63.	95.8	13.3
700.0	10509.	10.6	6.6	76.	80.3	16.6
650.0	12532.	8.0	1.9	65.	82.8	14.7
600.0	14688.	4.1	-2.6	62.	103.0	19.1
550.0	17001.	.6	-11.2	41.	123.9	15.1
500.0	19491.	-2.1	-24.5	16.		

STATION ALTITUDE 5939.00 FT MSL  
IN JULY 65 1228 MDT  
ASCENTION NO. 341

SIGHTING LEVEL DATA  
1990020555  
WHITFORD  
TABLE 9

OF PUBLIC COORDINATES  
32°40'43" LAT DEG  
106°37'33" LON DEG

DESCRIPT. GROUP	TEMPERATURE	REL. HUM.
ALTITUDE MILLIMETERS FEET	AIR DEGREES CENTIGRADE	PERCENT
691.2	3089.0	31.7
671.2	4325.0	29.8
656.0	5065.1	27.8
796.4	7140.9	21.4
741.8	8032.5	15.5
716.6	9016.2	12.7
703.0	10539.7	10.9
691.5	10675.1	10.4
676.7	10866.5	10.2
685.4	11118.0	10.5
691.5	11274.5	10.3
672.0	11659.5	10.8
636.6	13160.5	7.1
662.5	14616.3	4.3
585.8	15370.3	3.9
568.6	16166.4	3.0
539.9	17538.9	0.0
518.4	18605.1	-2.3
506.0	19547.4	-3.1

STATION ALTITUDE 3980.000 FT. 1 MSL  
19 JULY 1950 1228 MDT

UPPER AIR DATA  
1991020350  
WHITE SANDS

TABLE 10

CEONTRIC ALTITUDE MSL FT	PRESURE MILLIBARS	TEMPERATURE AIR DEGREES C	RELATIVE HUMIDITY PERCENT	DENSITY GM/CUBIC METER	SHFT ED OF WIND DATA DEGREES (TN)	SHFT ED KNOTS	INDEX OF REFRACTION
5989.0	881.2	31.7	15.0	0.999.3	682.8	135.0	9.9
4000.0	860.9	31.6	15.5	0.999.2	682.7	135.1	9.9
4500.0	860.9	29.3	12.7	0.991.0	679.7	138.9	9.9
5000.0	851.3	27.9	12.0	0.978.6	678.2	142.7	10.0
5500.0	830.7	26.4	12.4	0.960.7	076.5	146.4	10.1
6000.0	820.3	24.9	12.1	0.954.9	674.8	150.0	10.2
6500.0	800.2	23.4	11.7	0.943.4	673.0	153.5	10.4
7000.0	794.3	21.4	11.3	0.932.0	671.2	153.5	10.0
7500.0	780.4	20.2	10.9	0.920.9	669.4	149.7	9.0
8000.0	760.7	18.6	10.5	0.909.9	667.5	145.1	8.0
8500.0	752.3	16.7	9.9	0.899.1	665.6	131.5	7.8
9000.0	740.0	15.3	9.4	0.888.4	663.0	114.0	8.7
9500.0	726.8	13.7	9.2	0.877.3	661.8	100.8	10.2
10000.0	713.6	12.2	8.7	0.866.1	660.1	92.4	12.6
10500.0	701.0	11.0	8.0	0.854.4	658.6	86.9	15.2
11000.0	689.4	10.3	5.2	0.841.8	657.5	86.5	14.9
11500.0	675.9	10.0	3.2	0.826.3	657.7	86.1	14.3
12000.0	663.7	10.0	2.1	0.813.5	656.8	85.9	13.5
12500.0	651.0	6.7	1.4	0.802.1	655.4	85.7	13.4
13000.0	639.8	7.6	0.0	0.791.1	653.9	85.7	13.6
13500.0	625.6	0.4	-2.2	0.62.2	779.7	052.6	89.1
14000.0	612.5	5.5	-1.1	0.62.6	768.1	051.4	93.5
14500.0	600.2	4.5	-1.9	0.62.9	756.7	050.3	102.7
15000.0	584.0	4.1	-4.1	0.54.9	744.2	649.6	113.9
15500.0	565.6	3.6	-6.8	0.46.0	731.7	649.0	122.7
16000.0	572.2	3.2	-8.4	0.42.3	719.7	648.3	129.4
16500.0	561.5	2.3	-9.4	0.41.5	708.6	647.2	131.3
17000.0	551.6	1.2	-10.2	0.42.2	698.3	645.9	127.6
17500.0	540.7	0.1	-11.0	0.42.9	686.1	644.6	124.1
18000.0	530.5	-1.0	-13.4	0.38.2	678.0	643.2	119.2
18500.0	520.5	-2.1	-16.1	0.33.1	668.0	641.6	10.9
19000.0	510.6	-2.6	-10.6	0.25.7	656.4	641.1	1.000153
19500.0	500.9	-3.1	-21.1	0.17.8	645.7	640.5	1.000148

GEODLATIC COORDINATES  
32°40'43" LAT DEG  
106.37033 LONG DEG

STATION ALTITUDE 3,989.00 FT MSL  
18 JULY 63 1228 MDT  
ASCENSION NO. 356

MANDATORY LEVELS  
1990020356  
WILHELMUS

OPTIONAL COORDINATES  
32.4003 LAT DEG  
106.37033 LON DEG

TABLE 11

PRESSURE (DEPOTENTIAL MILLIBARS)	FL FT	TEMPERATURE DEGREES, CENIGRADE	AIR DEFW/10TH PERCENT	REL. HUM. PERCENT	WIND DATA DIRECTION DEGREES (IN) SPEED KILO'S
850.0	5041.	27.8	12.6	39.	145.0 10.0
800.0	6700.	22.5	11.5	50.	154.9 10.4
750.0	8617.	16.5	9.8	64.	126.9 7.9
700.0	10529.	10.9	6.0	82.	86.9 15.2
650.0	12556.	8.6	1.5	60.	85.7 15.4
600.0	14712.	4.2	-2.7	61.	107.7 14.1
550.0	17027.	1.1	-10.3	42.	127.5 14.7
500.0	19519.	-3.1	-24.6	17.	

STATION ALTITUDE 3969.00 FEET MSL  
18 JULY 83 1400 MDT  
ASCENSION NO. 559

SIGNIFICANT LEVEL DATA  
1990020359  
WHITE SANDS  
TABLE 12

GEODETIC COORDINATES  
32°40'04.3 LAT N  
106°37'03.3 LONG E

PRESSURE (FORMATIC MILLIBARS MSL)	TEMPERATURE ALTIMETER DEGREES CELSIUS	WIND DIRECTION PERCENT
1010.1	30.9	30.0
976.1	31.2	32.0
856.0	28.2	37.0
771.1	19.5	49.0
718.8	13.9	63.0
700.0	11.3	71.0
694.4	11.2	87.0
675.3	9.7	89.0
647.5	6.6	85.0
615.2	5.0	50.0
602.7	3.6	35.0
594.1	3.9	51.0
582.8	3.8	35.0
568.3	3.1	37.0
559.1	2.6	41.0
500.0	23.7	20.0

STATION ALTITUDE 1989.000 FEET MSL  
18 JULY 83  
ASCENDING NO. 59  
MSL FEET MILLIARS DEGREES CENTIGRADI

UPPER AIR DATA  
1930020359  
WHITE SANDS  
TABLE 13

UFRONTIC COORDINATES  
32.40943 LAT 106.6  
106.37033 LONG DEG

REFL. TRAC	REFL. SURFACE	REFL. NATURE	REFL. HUM.	REFL. SPED. OF	W.L.D. DATA	INDEX
ALTITUDE	AIR	INFRARED	PERCENT	GM/CM <sup>2</sup>	DIRCTION	OF
MSL FEET	MILLIARS	DEGREES	CENTIGRADI	METER	DEGREES	REFRACTION
3489.0	900.1	33.9	13.9	30.0	991.7	685.0
6000.0	679.8	33.6	13.6	30.2	992.2	684.7
4000.0	664.9	24.7	12.2	39.1	988.7	680.1
3000.0	650.5	28.2	12.1	36.9	976.7	678.5
2000.0	635.6	26.7	11.9	39.1	964.9	676.7
1000.0	621.4	25.1	11.6	41.2	953.3	679.9
5000.0	307.0	23.6	10.4	43.4	941.9	673.1
7000.0	192.1	22.0	9.7	45.5	930.7	671.2
12000.0	173.5	20.5	9.0	47.7	919.7	669.4
18000.0	165.9	19.0	8.4	50.4	908.4	667.7
25000.0	152.3	17.5	8.1	53.9	896.7	666.0
30000.0	139.1	16.1	7.7	57.5	885.3	664.4
40000.0	120.0	14.7	7.3	61.0	874.0	662.7
100000.0	71.1	13.3	6.9	65.4	862.7	661.1
105000.0	70.5	11.9	6.7	70.9	851.5	659.4
110000.0	687.7	11.0	5.2	67.2	839.0	658.3
115000.0	675.5	9.7	6.3	68.0	827.8	656.7
120000.0	662.9	8.3	4.2	75.1	816.6	655.7
125000.0	650.9	7.0	4.0	81.2	805.6	653.6
130000.0	639.0	6.2	2.4	76.5	793.5	652.5
135000.0	627.2	5.6	0.4	67.5	781.0	651.6
140000.0	615.7	5.0	-2.4	58.4	768.7	650.8
145000.0	604.5	3.8	-6.3	55.4	758.1	649.2
150000.0	592.1	3.4	-5.7	49.7	743.9	649.5
155000.0	582.1	3.0	-10.2	35.1	731.0	648.9
160000.0	571.3	3.2	-10.2	36.6	718.6	646.3
165000.0	560.7	2.7	-10.7	38.0	708.2	647.0
170000.0	550.2	0.8	-11.4	39.5	696.3	645.4
175000.0	539.9	-0.1	-12.1	40.9	688.7	643.8
180000.0	529.7	-1.4	-14.5	36.1	678.1	642.6
185000.0	519.6	-2.4	-17.2	30.7	667.7	641.4
190000.0	509.1	-3.3	-20.3	25.4	657.4	640.3
195000.0	500.1	-4.2	-23.7	20.1	647.3	639.1

INITIAL ALTITUDE 10000 FT MSL  
18 JULY 83 1400 MDT  
ASCENTION HGT. 3500

MATERIALS LEVELS  
19900 ± 0.255  
WHITE SANDS

GEODETIC COORDINATES  
32°49.4' LAT DEG  
106°37.3' LON DEG

TABLE 14

PRESSURE FT MSL	GEOPOTENTIAL FT	TEMPERATURE AIR DEGREES CFNTIGRAD	REL.HUM. PERCENT	WIND DATA DIRECTION DEGREES (TN)	WIND DATA SPEED KNOTS
850.0	9006.	28.2	12.1	37.	134.5 8.7
800.0	6757.	22.8	10.1	44.	125.6 12.9
750.0	6584.	17.3	8.0	55.	112.5 12.4
700.0	10502.	11.8	6.7	71.	106.5 12.9
650.0	12525.	6.9	4.0	82.	94.6 13.1
600.0	14675.	3.7	-4.8	54.	107.6 12.2
550.0	16989.	-1.4	-11.4	39.	126.8 11.3
500.0	19477.	-4.2	-23.7	20.	

END

FILMED

9-83

DATING